Assignment 01

Spring 2024 OOP (due: 07-02-24)

Submission will be at Google Classroom.

Create/define a comprehensive class for *Rational Numbers*. Rational Numbers are pair of integers, one is named as numerator and other as denominator. The denominator cannot have value ZERO. At Wolfram MathWorld, the Rational Numbers are defined as:

Wolfram MathWorld FROM THE MAKERS OF MATHEMATICA AND WOLFRAM|ALPHA

A rational number is a number that can be expressed as a fraction p/q where p and q are integers and $q \neq 0$. A rational number p/q is said to have numerator p and denominator q.

The functionality of the Rational Numbers contains at least:

- **__init__ # for variety of parameters and types**
- **__repr__ and __str__ functions *(in the form n|d)***
- **Getters/setters (accessors/mutators) for each data member**
- **Simplification of a rational number *(2|3 is simple form of 4|6 or 24|36)***
- **Testing of equivalent rational numbers *(4|7 is equal to 4|7 and 8|14)***
- **Reciprocal of a rational number**
- **Conversions to and from integers and floats, and Boolean and strings**
- **Absolute value, arithmetic inverse, and power of rational numbers**
- **Arithmetic operations on rational numbers**
  - **Arithmetic operations with other types**
- **Comparison operations on rational numbers**
  - **Comparison operations with other types**
- **And many more**